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University of Hawaii at Manoa

Environmental Center
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December 3, 1987
RP:0083

District Engineer (PODCO-O)
U.S. Army Corps of Engineers
Building 230
Fort Shafter, Hawaii 96858

Dear Sir:

Application for
Department of Army Permit (PODCO-O 1988-S)
Atlantis Submarines, Inc.
(Operation of Submersibles as a Public Attraction
in the Waters Off Waikiki)
Waikiki, Oahu

The principal activities of this project include establishment of commercial submarine tours and the installation of related artificial reef structures and mooring facilities. Our review was prepared with the assistance of Hans-Jurgen Krock and Harold Loomis, Ocean Engineering; and Jennifer Crummer, Environmental Center.

The lack of information regarding current conditions has made several potential impacts difficult to assess. The application states that all artificial reef structures will be placed at 90 to 100 feet and 200 to 250 feet. The highest of the sunken vessels will be at least 40 feet below sea level. We estimate that tsunamis with magnitudes approximately equal to those of 1946 or 1960 could produce currents of approximately 2 knots at a depth of 90 feet. Under storm conditions, currents of up to approximately 4 knots could be experienced at 90 feet for longer periods of time. In both cases these current estimates would likely increase by about 33 percent at a depth of 60 feet. Though Mamala Bay is considered to be relatively calm, it cannot be excluded from other circumstances. Storm surges and such non predictable conditions should be discussed with respect to effects upon the submersible and transfer barge.

Additionally, a more detailed description of the moorings should be provided particularly with regard to their stability during storms. Specifics on riser chain lengths need to be included. It is our understanding that there are several moorings presently in Mamala Bay from which this information could be gained. It would be prudent to seek information from those individuals with experience in mooring in this area.

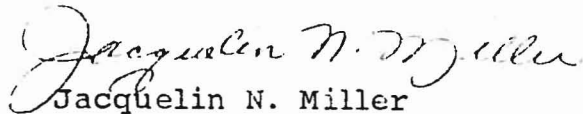
District Engineer (PODCO-0)

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December 3, 1987

Thank you for the opportunity to comment on this document. We look forward to your consideration and response to our comments.

Sincerely,

A handwritten signature in cursive script, reading "Jacquelin N. Miller".

Jacquelin N. Miller
Associate Environmental Coordinator

cc: OEQC

Eric Guinther, AECOS, Inc.

L. Stephen Lau

Hans-Jurgen Krock

Harold Loomis

Jennifer Crummer